

Life Processes

Competency Based Questions

♦ Multiple Choice Questions (MCQs)

1. Which of the following are energy foods?

- (a) Carbohydrates and fats
- (b) Proteins and mineral salts
- (c) Vitamins and minerals
- (d) Water and roughage

Ans. (a) Carbohydrates and fats

2. In which mode of nutrition an organism derives its food from the body of another living organism without killing it?

- (a) Saprotrophic nutrition
- (b) Parasitic nutrition
- (c) Holozoic nutrition
- (d) Autotrophic nutrition

Ans. (b) Parasitic nutrition

3. The mode of nutrition found in fungi is:

- (a) Parasitic nutrition
- (b) Holozoic nutrition
- (c) Autotrophic nutrition
- (d) Saprotrophic nutrition

Ans. (d) Saprotrophic nutrition

4. Roots of the plants absorb water from the soil through the process of:

- (a) diffusion
- (b) transpiration
- (c) osmosis
- (d) none of these

Ans. (c) osmosis

5. The site of photosynthesis in the cells of a leaf is

- (a) chloroplast
- (b) mitochondria
- (c) cytoplasm
- (d) protoplasm

Ans. (a) chloroplast

6. In amoeba, food is digested in the:

- (a) food vacuole
- (b) mitochondria
- (c) pseudopodia
- (d) chloroplast

Ans. (a) food vacuole

7. Which of the following events in the mouth cavity will be affected if salivary amylase is lacking in the saliva?

- (a) Starch breaking down into sugars.
- (b) Proteins breaking down into amino acids.
- (c) Absorption of vitamins.
- (d) Fats breaking down into fatty acids and glycerol.

Ans. (a) Starch breaking down into sugars.

8. Which region of the alimentary canal absorbs the digested food?

- (a) Stomach
- (b) Small intestine
- (c) Large intestine
- (d) Liver

Ans. (b) Small intestine

9. The contraction and expansion movement of the walls of the food pipe is called:

- (a) translocation
- (b) transpiration
- (c) peristaltic movement
- (d) digestion

Ans. (c) peristaltic movement

10. When a few drops of iodine solution are added to rice water, the solution turns blue-black in colour. This indicates that rice water contains:

- (a) fats
- (b) complex proteins
- (c) starch
- (d) simple proteins

Ans. (c) starch

11. The exit of unabsorbed food material is regulated by
 (a) liver (b) anus
 (c) small intestine (d) anal sphincter
 Ans. (d) anal sphincter
12. What are the products obtained by anaerobic respiration in plants?
 (a) Lactic acid + Energy
 (b) Carbon dioxide + Water + Energy
 (c) Ethanol + Carbon dioxide + Energy
 (d) Pyruvate
 Ans. (c) Ethanol + Carbon dioxide + Energy
13. The breakdown of pyruvate to give carbon dioxide, water and energy takes place in
 (a) cytoplasm (b) mitochondria
 (c) chloroplast (d) nucleus
 Ans. (b) mitochondria
14. Glycolysis process occurs in which part of the cell?
 (a) Cytoplasm (b) Nucleus
 (c) Mitochondria (d) Chloroplast
 Ans. (a) Cytoplasm
15. Name the substances whose build up in the muscles during vigorous physical exercise may cause cramps?
 (a) Ethanol + Carbon dioxide + Energy
 (b) Lactic acid + Energy
 (c) Carbon dioxide + Water + Energy
 (d) Pyruvate
 Ans. (b) Lactic acid + Energy
16. Name the pores in a leaf through which respiratory exchange of gases takes place.
 (a) Lenticels (b) Vacuoles
 (c) Xylem (d) Stomata
 Ans. (d) Stomata
17. The respiratory pigment in human beings is:
 (a) carotene (b) chlorophyll
 (c) haemoglobin (d) mitochondria
 Ans. (c) haemoglobin
18. Which plant tissue transports water and minerals from the roots to the leaf?
 (a) Xylem (b) Phloem
 (c) Parenchyma (d) Collenchyma
 Ans. (a) Xylem
19. The movement of food in phloem is called:
 (a) transpiration (b) translocation
 (c) respiration (d) evaporation
 Ans. (b) translocation
20. A blood vessel which pumps the blood from the heart to the entire body:
 (a) artery (b) capillary
 (c) Vein (d) Haemoglobin
 Ans. (a) artery
21. Name a circulatory fluid in the human body other than blood.
 (a) Platelets (b) RBC
 (c) Lymph (d) Plasma
 Ans. (c) Lymph
22. Single circulation, i.e., blood flows through the heart only once during one cycle of passage through the body, is exhibited by which of the following:
 (a) hyla, rana, draco
 (b) whale, dolphin, turtle
 (c) labeo, chameleon, salamander
 (d) hippocampus, exocoetus, anabas
 Ans. (d) hippocampus, exocoetus, anabas
23. Name the tube which connects the kidneys to the urinary bladder.
 (a) Urethra (b) Nephron
 (c) Tubule (d) Ureter
 Ans. (d) Ureter
24. Which part of nephron allows the selective reabsorption of useful substances like glucose, amino acids, salts and water into the blood capillaries?
 (a) Tubule (b) Glomerulus
 (c) Bowman's capsule (d) Ureter
 Ans. (a) Tubule
25. Where is the dirty blood in our body filtered?
 (a) Heart (b) Lungs
 (c) Ureter (d) Kidneys
 Ans. (d) Kidneys
26. The procedure used for cleaning the blood of a person by separating urea from it is called:
 (a) osmosis (b) filtration
 (c) dialysis (d) double circulation
 Ans. (c) dialysis
27. Which is the correct sequence of body parts in the human alimentary canal?
 (a) Mouth → stomach → small intestine → large intestine → oesophagus
 (b) Mouth → large intestine
 (c) Mouth → stomach → oesophagus → small intestine → large intestine
 (d) Mouth → oesophagus → stomach → large intestine → small intestine
 Ans. (b) Mouth → large intestine
28. Identify the correct path of urine in the human body.
 (a) Kidney → urinary bladder → urethra → ureter
 (b) Urinary bladder → ureter → kidney → urethra
 (c) Kidney → ureter → urethra → urinary bladder
 (d) Kidney → ureter → urinary bladder → urethra
 Ans. (d) Kidney → ureter → urinary bladder → urethra

◆ Assertion-Reason Questions

In the following question, a statement of Assertion (A) is followed by a statement of Reason (R). Answer these questions by selecting appropriate option given below:

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
- (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A)
- (c) Assertion (A) is true but Reason (R) is false.
- (d) Assertion (A) is false but Reason (R) is true.

1. **Assertion (A):** Raw materials needed for photosynthesis are carbon dioxide, water and minerals.

Reason (R): Nutrients provide energy to an organism.

Ans. (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

Raw materials needed for photosynthesis are carbon dioxide, water and minerals like nitrogen, phosphorus, iron and magnesium.

Nutrients are the substances required for proper growth and maintenance of a living body but they provide energy to an organism.

2. **Assertion (A):** Transpiration is a necessary evil.
Reason (R): It causes water loss but helps in absorption and upward movement of water and minerals.

Ans. (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

Transpiration is a necessary evil. It is so because water is lost in the form of vapours from the aerial parts of the plant through transpiration. But, it helps in absorption and upward movement of water and minerals creating transpiration pull.

3. **Assertion (A):** Translocation of sugar occurs through the phloem.

Reason (R): It is achieved by diffusion of sugars through phloem.

Ans. (c) Assertion (A) is true but Reason (R) is false.
The transport or movement of soluble products (sugar) of photosynthesis from leaves to other parts of the plant is termed as translocation. It occurs in the part of vascular tissue known as phloem. The translocation in phloem is mainly achieved by utilising energy by expenditure of ATP.

4. **Assertion (A):** Energy is used during the process of respiration.

Reason (R): Respiration stores energy in the form of ATP.

Ans. (d) Assertion (A) is false but Reason (R) is true.
Respiration involves the oxidation of glucose inside the mitochondria to produce energy, which is stored in the high energy bonds of ATP molecules as biologically useful energy.

5. **Assertion (A):** Artificial kidney is a device used to remove nitrogenous waste products from the blood through dialysis.

Reason (R): Reabsorption does not occur in artificial kidney.

Ans. (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

Kidney failure can be managed by artificial kidney. It is a device used to remove nitrogenous waste products from the blood through dialysis.

Artificial kidney is different from natural kidney as the process of reabsorption does not occur in artificial kidney.

6. **Assertion (A):** In woody plants, gaseous exchange occurs through lenticels.

Reason (R): Lenticels are specialised cells found along with stomata on the stem of woody plants.

Ans. (c) Assertion (A) is true but Reason (R) is false.
In woody plants, gaseous exchange occurs through the small pores found on stems called lenticels. Stomata on the stem aid in gaseous exchange, in herbaceous plants.

7. **Assertion (A):** Muscles of stomach wall possess thick layers of muscles.

Reason (R): These muscles help in mixing the food with the enzymes present in the alimentary canal.

Ans. (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

The lining of alimentary canal has muscles that contract rhythmically in order to push the food forward. This is known as peristaltic movement.

8. **Assertion (A):** Lipases help in emulsification of fats.

Reason (R): Lipases hydrolyse fats and oils.

Ans. (d) Assertion (A) is false but Reason (R) is true.
Bile helps in emulsification of fats whereas lipases are the enzymes which hydrolyse fats and oils.

9. **Assertion (A):** In humans, there is a complex respiratory system.

Reason (R): Human skin is impermeable to gases.

Ans. (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

Humans need more oxygen to maintain their high metabolic rates. Thus, a complex respiratory system has evolved so as to meet this need.

10. **Assertion (A):** Haemodialysis can save the life of patients with kidney failure.

Reason (R): Waste products like urea can be removed from the blood by haemodialysis.

Ans. (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

In case of kidney failure, haemodialysis is the process of purifying blood (or removing waste products like urea) by an artificial kidney. This can save the life of the patient.

◆ Case Study Based Questions

1. Read the following and answer any four questions from (i) to (v):

The force exerted by the blood against the wall of a vessel is called blood pressure. This pressure is much greater in arteries than in veins. The pressure of blood inside the artery during ventricular systole (contraction) is called systolic pressure and pressure in the artery during ventricular diastole (relaxation) is called diastolic pressure.

- (i) Study the table given below and select the row that has incorrect information:

		Systolic blood pressure	Diastolic blood pressure
(a)	Average range	90-120 mm of Hg	60-80 mm of Hg
(b)	Reading of blood pressure	High	Low
(c)	Ventricles of heart	Contract	Relaxed
(d)	Blood pressure in arteries	Minimum	Maximum

Ans. (d)

- (ii) The characteristics observed in hypertension are:

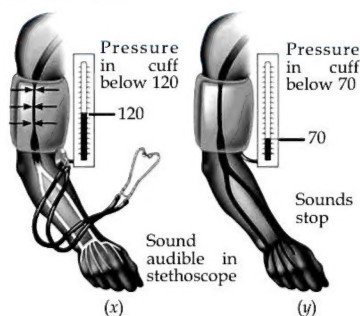
- (i) Constriction of arterioles
- (ii) Results in rupture of an artery
- (iii) Causes internal bleeding
- (iv) Increased blood flow

Choose the correct option based on the statements.

- (a) 1 and 2
- (b) 1, 2 and 3
- (c) Only 4
- (d) 2, 3 and 4

Ans. (d) 2, 3 and 4

- (iii) Choose the correct combination to depict the given figure:



- (a) x. Systolic pressure, y. Systolic pressure
- (b) x. Systolic pressure, y. Diastolic pressure
- (c) x. Diastolic pressure, y. Systolic pressure
- (d) x. Diastolic pressure, y. Diastolic pressure

Ans. (b) x. Systolic pressure, y. Diastolic pressure

- (iv) A person travelling through a public transport suddenly fainted. Upon check-up by a health care provider, it was found that his blood pressure was 152-95. Name the medical condition that the person is going through.

- (a) Low blood pressure
- (b) High blood pressure
- (c) Low sugar level
- (d) High sugar level

Ans. (b) High blood pressure

- (v) In the case (iv), the health care provider used an instrument to check the blood pressure of the patient. Name the instrument used by the health care provider.

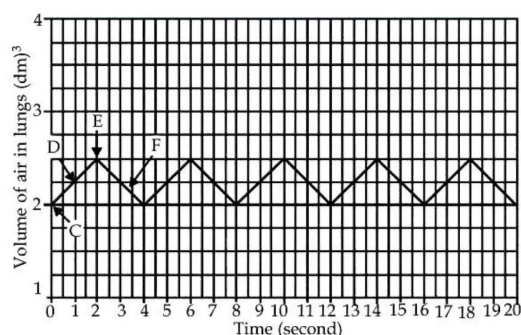
- (a) Stethoscope
- (b) Pulse oximeter
- (c) Sphygmomanometer
- (d) Otoscope

Ans. (c) Sphygmomanometer



2. Read the following and answer any four questions from (i) to (v):

During inhalation, the diaphragm is contracted which increases the volume of the lung cavity. During exhalation, the diaphragm is relaxed which decreases the volume of the lung cavity. The given graph is related to the changes in the volume of lungs of a person at a rest over a period of 20 seconds.



(i) How many breaths per minute is the person taking when at rest?

- (a) 110 (b) 15
(c) 17 (d) 20

Ans. (b) 15

It is clear from the given graph that the person is taking 5 breaths per 20 sec, so in 1 minute (60 sec) he will take 15 breaths ($5/20 \times 60$).

(ii) Which two points in the graph (C, D, E or F), shows inspiration and expiration?

- (a) D, E (b) D, F
(c) C, D (d) E, F

Ans. (b) D, F

Point 'D' shows increase in the volume of lungs, thus at this point, inspiration is taking place while point 'F' shows decrease in the volume of lungs, thus at this point, expiration is taking place.

(iii) Which of the following muscles help during inhalation?

- (a) External intercostal muscles
(b) Internal intercostal muscles
(c) Both (a) and (b)
(d) None of these

Ans. (c) Both (a) and (b)

External and internal intercostals muscles are specialised set of muscles that help during inhalation.

(iv) During vigorous exercise, the rate of breathing of normal man is

- (a) 20 to 25 times per minute
(b) 50 to 90 times per minute
(c) 100 to 150 times per minute
(d) 40 to 70 times per minute

Ans. (a) 20 to 25 times per minute

The rate of breathing increases during vigorous exercise. This is because the body needs more energy which can be released only if greater amounts of oxygen reach the cells. For this purpose, the rate of breathing increases. This will increase the supply of oxygen to the cells.

(v) Which is the correct sequence of air passage during inhalation?

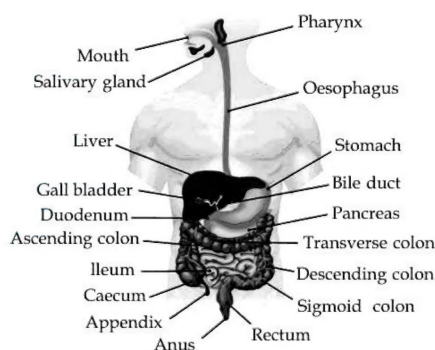
- (a) Nostrils → larynx → pharynx → trachea → lungs
(b) Nasal passage → trachea → pharynx → larynx → alveoli
(c) Larynx → nostrils → pharynx → lungs
(d) Nostrils → pharynx → larynx → trachea → alveoli

Ans. (d) Nostrils → pharynx → larynx → trachea → alveoli

3. Read the following and answer any four questions from (i) to (v):

In human being, the holozoic nutrition takes place in five steps:

1. **Ingestion.** The process of taking food inside the body is called ingestion.
2. **Digestion.** In digestion, the ingested food is converted into simple form with the help of digestive enzymes.
3. **Absorption.** In this stage the food digested in second step is absorbed into the cells of body.
4. **Assimilation.** Assimilation is the process of utilising the food absorbed in third step by various cells of the body.
5. **Egestion.** Egestion is the final step of holozoic nutrition in which the undigested food is removed from the body.



(i) Which is the correct sequence of parts in human alimentary canal?

- (a) Mouth → Stomach → Small intestine → Oesophagus → Large intestine
(b) Mouth → Oesophagus → Stomach → Large intestine → Small intestine
(c) Mouth → Stomach → Oesophagus → Small intestine → Large intestine
(d) Mouth → Oesophagus → Stomach → Small intestine → Large intestine

Ans. (d) Mouth → Oesophagus → Stomach → Small intestine → Large intestine

(ii) If salivary amylase is lacking in the saliva, which event in the mouth cavity will be affected?

- (a) Proteins breaking down into amino acids
- (b) Starch breaking down into sugars
- (c) Fats breaking down into fatty acids and glycerol
- (d) Absorption of vitamins

Ans. (b) Starch breaking down into sugars

(iii) The inner lining of stomach is protected by one of the following from hydrochloric acid, choose the correct one:

- (a) Pepsin
- (b) Mucus
- (c) Salivary amylase
- (d) Bile

Ans. (b) Mucus

(iv) Which part of alimentary canal receives bile from the liver?

- (a) Stomach
- (b) Small intestine
- (c) Large intestine
- (d) Oesophagus

Ans. (b) Small intestine

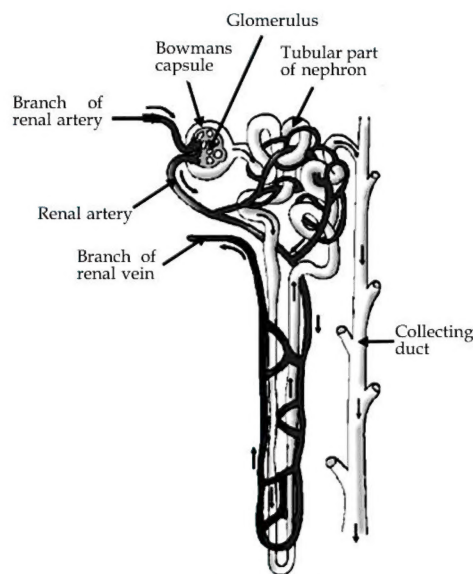
(v) Choose the function of the pancreatic juice from the following.

- (a) Trypsin digests proteins and lipase carbohydrates
- (b) Trypsin digests emulsified fats and lipase proteins
- (c) Trypsin and lipase digest fats.
- (d) Trypsin digests proteins and lipase digests emulsified fats droplets

Ans. (d) Trypsin digests proteins and lipase digests emulsified fats droplets

4. Read the following and answer any four questions from (i) to (v).

Each capillary cluster in the kidney is associated with the cup-shaped end of a tube that collects the filtered urine (see adjoining figure). Each kidney has large numbers of these filtration units called nephrons packed close together. Some substances in the initial filtrate, such as glucose, amino acids, salts and a major amount of water, are selectively re-absorbed as the urine flows along the tube. The amount of water reabsorbed depends on how much excess water there is in the body, and on how much of dissolved waste there is to be excreted. The urine forming in each kidney eventually enters a long tube, the ureter, which connects the kidneys with the urinary bladder. Urine is stored in the urinary bladder until the pressure of the expanded bladder leads to the urge to pass it out through the urethra. The bladder is muscular, so it is under nervous control, as we have discussed elsewhere. As a result, we can usually control the urge to urinate.



Structure of a nephron

(i) Which of the following is the correct path taken by urine in our body?

- (a) kidney → ureter → urethra → bladder
- (b) kidney → bladder → urethra → ureter
- (c) kidney → ureter → bladder → urethra
- (d) bladder → kidney → ureter → urethra

Ans. (c) kidney → ureter → bladder → urethra

(ii) The excretory unit in the human excretory system is called:

- (a) nephron
- (b) neuron
- (c) nephridia
- (d) kidney

Ans. (a) nephron

(iii) The substance which is not reabsorbed into the blood capillaries surrounding the tubule of a nephron is mainly:

- (a) glucose
- (b) amino acid
- (c) urea
- (d) water

Ans. (c) urea

(iv) The procedure of cleaning the blood of a person by using a kidney machine is known as:

- (a) ketolysis
- (b) hydrolysis
- (c) dialysis
- (d) photolysis

Ans. (c) dialysis

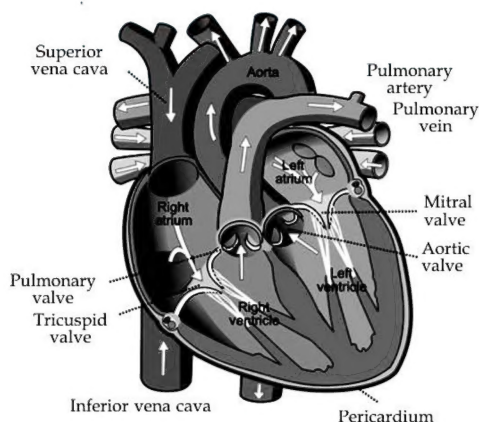
(v) The kidneys in human beings are a part of the system for

- (a) nutrition
- (b) respiration
- (c) excretion
- (d) transportation

Ans. (c) excretion

5. Read the following and answer any four questions from (i) to (v):

The human heart is a muscular organ made up of cardiac muscles. It is a four-chambered organ to prevent intermixing of oxygenated and de-oxygenated blood. A thick wall muscle called septum that separates the two sides left and right of the heart. Look at the picture.



(i) The upper two chambers and lower two chambers are called:

- (a) Ventricles and auricles respectively
- (b) Auricles and ventricles respectively
- (c) Ventricles and valves respectively
- (d) Arteries and veins respectively

Ans. (b) Auricles and ventricles respectively

(ii) The artery which carries de-oxygenated blood from the heart into lungs is called _____.

- (a) Pulmonary artery
- (b) Hepatic artery
- (c) Renal artery
- (d) All arteries

Ans. (a) Pulmonary artery

(iii) Pulmonary vein brings:

- (a) oxygenated blood from the lungs to the heart.
- (b) de-oxygenated blood from the heart to the lungs.
- (c) oxygenated blood from the heart to the lungs.
- (d) de-oxygenated blood from the lungs to the heart.

Ans. (a) oxygenated blood from the lungs to the heart.

(iv) Tricuspid valve is found between:

- (a) right auricle and right ventricle
- (b) left auricle and left ventricle
- (c) right auricle and left ventricle
- (d) left auricle and right ventricle

Ans. (a) right auricle and right ventricle

(v) The de-oxygenated blood from the body organs first enters:

- (a) into right atrium of the heart through vena cava.
- (b) into left atrium of the heart through vena cava.
- (c) into right ventricle of the heart through vena cava.
- (d) into right atrium of the heart through aorta.

Ans. (a) into right atrium of the heart through vena cava.

